

REMARKS

Claims 1-27 are pending in the application. Claims 1-7, 12, 14-21 and 27 are withdrawn from consideration pursuant to a previously imposed restriction requirement and subsequent election of claims 8-11, 13 and 22-26. Applicant respectfully requests reconsideration in light of the amendments made herein taken with the following remarks. Claims 8-11, 13 and 22-26 have been amended by way of this Amendment After Final to address the Examiner's rejection under 35 U.S.C. §112, second paragraph and to positively recite the feature of a pre-cut protective tape according to the Examiner's suggestion. Applicant respectfully submits that the Amendment After Final Rejection places the claims in better condition for purposes of Appeal, and does not raise any new issues of patentability requiring further search and consideration by the Examiner. Applicant respectfully submits that no new matter is being added by way of this Amendment After Final Rejection.

Rejection under 35 U.S.C. §112, second paragraph:

Claims 8-11, 13 and 22-26 stand rejected under 35 U.S.C. §112, second paragraph for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Specifically, the Examiner indicates that the recitations of "means for moving the fixing roll" and "means for moving the sticking roll" are improper because the "means for" language is not appropriately supported by the specification according to 35 U.S.C. §112, sixth paragraph.

Claim 8 has been amended to replace the "means for" language with "a mechanism". Applicant respectfully submits that claim 8, as recited, does not warrant treatment under 35 U.S.C. §112, sixth paragraph. Further, Applicant respectfully submits that adequate support for this claim language can be found in the specification at page 22, line 21 to page 23, line 18. Applicant respectfully requests that the rejection under 35 U.S.C. §112, second paragraph be withdrawn.

Rejections under 35 U.S.C. §103(a):

Claims 8-10, 13, 24 and 25 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,328,546 to Brady et al. (hereinafter "Brady") in view

of U.S. Patent No. 6,803,320 to Yamamoto (hereinafter "Yamamoto") and U.S. Patent No. 6,715,524 to Chen et al. (hereinafter "Chen"). This rejection is respectfully traversed.

The present invention relates to a method and apparatus for sticking a tape to an adherend such as a semiconductor wafer. More particularly, the invention relates to a method and apparatus capable of preventing the warpage of an adherend, such as a thin semiconductor wafer, to which a protective tape has been stuck.

Specifically, pre-cut protective tapes 12 are attached to a long support film 10, and the support film 10 is attached to frame member 18 at positions where the pre-cut protective tape 12 to be stuck to an adherend (wafer) 14 is positioned within the frame member 18. The support film 10 is pressed to stick the pre-cut protective tape 12 to the adherend (wafer) 14, and the support film 10 is released from the tape 12. The long support film 10 is under tension, but this tension is decreased with respect to the pre-cut, spaced-apart protective tapes 12 when the support film 10 is attached to the frame member 18.

Accordingly, the pre-cut protective tape 12 stuck to the adherend has reduced residual stress, and the adherend such as a thin semiconductor wafer to which the tape 12 has been stuck is free from warpage which would otherwise be caused by a protective tape applied under tension.

Additionally, the protective tape 12 is pre-cut to approximately the shape of the adherend (wafer). Therefore, the pre-cutting prevents the cutter from damaging the outer peripheral edge of the wafer, which is a problem in the prior art.

Brady discloses a photo resist film application mechanism for applying a layer of dry film resist (18) to a semiconductor wafer (72). In particular, Brady discloses a tape transport assembly (44) at one point being positioned over a laminating assembly (71). A semiconductor wafer (72) is positioned within a heated vacuum chuck assembly (74). A pre-cut portion of laminate (14), disposed on a transport tape (40), is then applied to the wafer (72) by a lamination roller (46), which presses the laminate (14) onto the wafer (72). See Figures 1A-B, 2D and 5 and column 5, lines 3-39.

Yamamoto discloses a protective tape separating apparatus (15). The apparatus (15) comprises a chuck table (19). A wafer (W) having two layers of protective tape (T1, T3) applied thereto is positioned on the chuck table (19) within a mount frame (F). Mount frame (F)

includes an adhesive tape (Tn) that the wafer (W) is secured to and a ring frame (f) surrounding the wafer. Mount frame (F) operates to secure the wafer (W) in position on the chuck table (19) as the top layer of protective tape (T3) is separated from the inner layer (T1) and the wafer (W). Separating tape (Ts) passes through a separating mechanism (20) and adheres to the top layer of protective tape (T3) so as to peel the protective tape (T3) from the wafer (W). Separating mechanism (20) traverses across the ring frame (f) in order to apply the separating tape (Ts) across the length of the wafer (W). See Figures 6-9 and column 6, line 13-column 7, line 40.

Chen discloses a laminating system for applying a dry resist layer (3) to a substrate (36). In particular, Chen discloses a laminating head (24) that traverses across the length of the substrate (36) in order to apply a strip of laminate tape (1) having a support film (4) disposed over a layer of dry resist material (3) to the surface of the substrate (36) by pressing the laminate tape (1) on to the substrate (36). See Figure 4, column 5, lines 1-23 and column 6, lines 2-11.

The Examiner asserts that it would have been obvious to one of ordinary skill in the art to modify Brady to incorporate the frame taught by Yamamoto surrounding the adherend-mounting surface in order to effectively hold and contain the adherend during the lamination and fixing process. And further, that it would have been obvious to one of ordinary skill in the art to modify Brady to incorporate the laminating head taught by Chen in order to provide sufficient and even pressure during the lamination step.

Applicant respectfully submits that in order to establish a *prima facie* case of obviousness, three criteria must be met. First, the modification or combination must have some reasonable expectation of success. Second, the prior reference or combined references must teach or suggest all the claim limitations. MPEP §2143. Finally, an apparent reason for one of ordinary skill in the art to combine the prior art teachings to reach the claimed invention should be identified. *KSR Int'l Co. v. Teleflex, Inc.*, 82 USPQ2d 1385 (U.S. 2007). The analysis of an obviousness finding should be made explicit. *Id.*

With regard to independent claim 8, the claim recites specific claim language as to "a frame member surrounding the adherend-mounting surface of the mounting table", "a movable fixing roll for attaching and fixing a long support film **to the frame member**" and "a movable sticking roll for sticking the pre-cut protective tape to the adherend". According to the

Examiner, the laminating roller (46) of Brady corresponds to the claimed fixing roll and that while Brady fails to teach a frame member or a sticking roll, Yamamoto and Chen provide corresponding components that could be incorporated into the mechanism taught by Brady in order to meet the above-mentioned subject matter. Applicant respectfully submits that Brady, Yamamoto and Chen, taken separately or combined, fail to teach or suggest the above-mentioned subject matter.

Applicant respectfully submits that the laminating roller (46) taught by Brady does not correspond to Applicant's claimed fixing roll as Brady does not teach or suggest that the laminating roller (46) attaches and fixes a support film to a frame member. Rather, the laminating roller (46) of Brady is used to press the laminate decal (14) suspended from the transport tape (40) onto the semiconductor wafer (72) as shown in Figures 2D and 5.

According to the Examiner, it would have been obvious to incorporate the frame mount (F) taught by Yamamoto into the mechanism of Brady. Yamamoto teaches a separating apparatus (15) having a separating mechanism (20) that traverses across a wafer (W) in order to remove, not apply, protective tape (T3, T1) from the wafer as shown in Figures 6-9. Applicant respectfully submits that at no point does Yamamoto teach or suggest that the separating mechanism (20) and separator roller (21) attach and fix a support film to the ring frame (f) or even suggest that the separating tape (Ts) or protective tape layers (T3, T1) engage the ring frame (f) at any point. As such, even if one were to incorporate the teachings of Yamamoto as to the mount frame (F) into the mechanism of Brady, the laminating roller (46) of Brady would not function to **attach and fix a support film to such a frame** as neither Brady nor Yamamoto teach or suggest such operability. The rejection of claim 8 is therefore improper.

Further, the Examiner cites Chen for the teaching of the laminating head (24) that, according to the Examiner, corresponds to the claimed sticking roll. Applicant respectfully submits that the teachings of Chen are insufficient to overcome the deficiencies in the teachings of Brady and Yamamoto discussed above as Chen also fails to teach or suggest a frame member or a fixing roll for attaching and fixing a support film to the frame member.

Moreover, according to the Examiner, it would have been obvious to incorporate the laminating head (24) of Chen into the mechanism of Brady for the purpose of providing sufficient and even pressure during the lamination step. However, Applicant respectfully

submits that the laminating head (24) of Chen performs **the exact same function** as the laminating roller (46) of Brady as demonstrated in Figure 5 of Brady and Figure 4 of Chen. As such, addition of the laminating head taught by Chen into the mechanism of Brady would be redundant and thus one of ordinary skill in the art would see no benefit in modifying the mechanism of Brady as suggested by the Examiner. The rejection of claim 8 is therefore improper for these reasons as well.

Applicant respectfully submits that claim 8 is allowable over Brady, Yamamoto and Chen for at least the foregoing reasons. Applicant respectfully requests that the Examiner withdraw the rejection of claim 8 for being unpatentable over Brady in view of Yamamoto and Chen under §103(a).

Claims 9, 10, 13, 24 and 25 are dependent upon independent claim 8 and are allowable over Brady, Yamamoto and Chen for at least the same reasons as claim 8. Applicant respectfully requests that the Examiner withdraw the rejection of claims 9, 10, 13, 24 and 25 for being unpatentable over Brady in view of Yamamoto and Chen under §103(a).

Claims 11, 22, 23 and 26 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Brady in view of Yamamoto and Chen and in further view of U.S. Patent No. 6,080,263 to Saito et al. (hereinafter "Saito"). This rejection is respectfully traversed.

According to the Examiner, it would have been obvious to incorporate the aligning means taught by Saito into the mechanism taught by Brady for the purpose of accurately placing the protective film during the lamination steps and to ensure effective coverage of the wafer.

Applicant respectfully submits that the teachings of Saito are not sufficient to overcome the deficiencies in the teachings of Brady, Yamamoto and Chen as discussed with respect to claim 8. In particular, Saito fails to teach or suggest a frame member or a fixing roll attaching and fixing a support film to the frame member. The rejection is therefore improper.

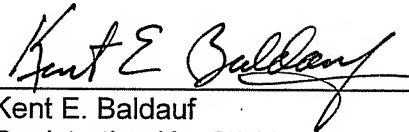
Claims 11, 22, 23 and 26 are dependent upon independent claim 8 and are allowable over Brady, Yamamoto, Chen and Saito for at least the same reasons as claim 8. Applicant respectfully requests that the Examiner withdraw the rejection of claims 11, 22, 23 and 26 for being unpatentable over Brady in view of Yamamoto and Chen and in further view of Saito under §103(a).

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The Examiner's reconsideration and favorable action regarding claims 8-11, 13 and 22-26 are respectfully requested.

Respectfully submitted,
THE WEBB LAW FIRM

By



Kent E. Baldauf
Registration No. 25,826
Attorney for Applicant
700 Koppers Building
436 Seventh Avenue
Pittsburgh, Pennsylvania 15219
Telephone: 412-471-8815
Facsimile: 412-471-4094
E-Mail: webblaw@webblaw.com